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Socio-economic value of fisheries – Annex B: Quick scoping review (MMO1387)



...ambitious for our seas and coasts

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Contents

B1 Introduction	6
B2 Method – Quick Scoping Review (QSR)	6
B2.1 Search protocol.....	6
B2.2 Search scope.....	7
B2.3 Search strategy.....	7
B2.4 Strategy for extracting information	8
B2.5 Approach to analysis	9
B3 Literature review findings	10
B3.1 Overview of the literature	10
B3.2 Social, cultural and economic wellbeing outcomes from fisheries	11
B3.3 Diverse values	16
B3.4 Sensitivity of wellbeing outcomes to change	21
B4 Discussion and conclusions	22
B4.1 Overview of findings	22
B4.2 Limitations	23
B4.3 Next steps.....	24
B5 References	24

Figures

Figure B 1 PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only.	9
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Tables

Table B 1 Scope of the search.	7
Table B 2 Geographical focus of studies identified.	10
Table B 3 Definitions of diverse values.	16

Annex B Quick scoping review

B1 Introduction

This Annex sets out the findings from a Quick Scoping Review (QSR) of the literature on social, cultural and economic outcomes arising from fishing, organised into the three dimensions of wellbeing described in the conceptual framework in Annex A. The evidence extracted from the literature is categorised into material, subjective and relational wellbeing outcomes and highlights to whom these outcomes accrue (to fishers, their families, the occupational and place-based community). The review also examines the barriers and enablers that may hinder or facilitate the realisation of wellbeing outcomes. It should be noted that the majority of the evidence captured in this review does not focus on wellbeing per se but has been reinterpreted through this review and assigned to a wellbeing dimension. As such it provides a new framing of the evidence.

The review focuses primarily on the inshore fishing fleet and vessels tied to a home port. These vessels are typically under 10m and tend to fish closer to shore. Fishing activities by this group are heterogeneous with fishers targeting different species, using different gear types and vessel configurations, and applying different business models. The study focuses on the inshore fishing fleet because the direct benefits it brings are likely to be locally received by their families, the occupational fishing communities they create and the place-based communities they operate within.

Wellbeing is only one component of the conceptual framework presented in Annex A. The framework also refers to capital assets and diverse values. The review does not focus on capital assets as they were not the main focus of this study, but where evidence supports, insights are provided into diverse values relevant to understanding the wellbeing outcomes related to these fisheries.

The findings from the review inform the next stage of this project: the development of indicators for material, subjective and relational wellbeing outcomes. The review also identifies the strengths of the evidence base as well as its limitations, highlighting areas where the MMO may seek to gather further evidence.

For definitions of the terminology used in this Annex, see Table A4 in Annex A.

B2 Method – Quick Scoping Review (QSR)

QSRs aim to provide a rapid overview of the evidence identified through a systematic approach to literature collection. While the aim is to be as comprehensive as possible within the given resources, it is recognised that gaps will likely remain as literature searches are restricted.

B2.1 Search protocol

The PEO (Population, Exposure, Outcome (PEO)) model underpinned the development of the research questions, in which:

- Population = fishers, their families, the occupational fishing community and the local place-based community.
- Exposure = fishery activities.
- Outcome = social, cultural and economic wellbeing outcomes of fishing.

The review aimed to answer the following research questions:

- What are the social, cultural and economic wellbeing outcomes resulting from local commercial fishing on fishers, their occupational fishing communities, their families, and the wider place-based community in the United Kingdom?
- What barriers hinder people from realising the social, cultural and economic wellbeing outcomes from local commercial fishing, and how do these vary among fishers, their families, their occupational fishing communities, and the wider non-fishing community?
- What enablers facilitate the realisation of social, cultural and economic wellbeing outcomes from fishing at both the individual fisher, their families, their occupational fishing community, and the wider place-based community level?
- How sensitive are the social, cultural and economic wellbeing outcomes of local commercial fishing to changes in environmental, economic, or regulatory conditions?

B2.2 Search scope

The scope of the search was limited temporally, geographically, and based on the language and literature type (Table B 1).

Table B 1 Scope of the search.

Characteristics of the literature	Inclusion criteria
Time period	Post 2000
Geographic range	National (UK: England, Scotland, Wales, Northern Ireland)
Language	English
Type of literature	Peer-reviewed evidence and grey

B2.3 Search strategy

The search string was developed based on key words relevant to the research questions and the conceptual framework. To create an efficient search string different versions of the string were tested to identify a version that captured the most pertinent papers and reports, and excluded those that were irrelevant. The final search string used was:

- ("local commercial fish*" OR "small-scale fish*" OR "artisanal fish*" OR "inshore fish*") AND

- ("social" OR "economic*" OR "cultural*" OR "income" OR "health" OR "wellbeing" OR "well-being" OR "value*" OR "heritage" OR "ecosystem service*") AND
- ("barriers" OR "enablers" OR "obstacles" OR "hindrances" OR "challenges" OR "facilitators") AND
- ("impacts" OR "consequences" OR "effects" OR "influence") AND
- ("fisher*") AND
- ("United Kingdom" OR "UK" OR "England" OR "Scotland" OR "Wales" OR "Northern Ireland")

The search was undertaken in Google Scholar for broad coverage and Scopus for accessing peer-reviewed literature¹. This was augmented by Countryside and Community Research Institute (CCRI) and Marine Management Organisation (MMO)-recommended sources for unpublished or difficult to access material. Targeted searches were also completed in Google where obvious evidence gaps emerged. Cross-referencing of highly cited papers was also used as a method to identify additional relevant papers, as well as a targeted author search.

Inclusion criteria: Primary focus was on studies that detail the social, cultural and economic wellbeing outcomes from inshore fishing in the UK context.

Exclusion criteria: Studies not pertaining to the UK, those primarily based on modelling, and those containing detail of social aspects of fishing without discussing wellbeing outcomes (e.g., papers focusing on management and responses to it).

B2.4 Strategy for extracting information

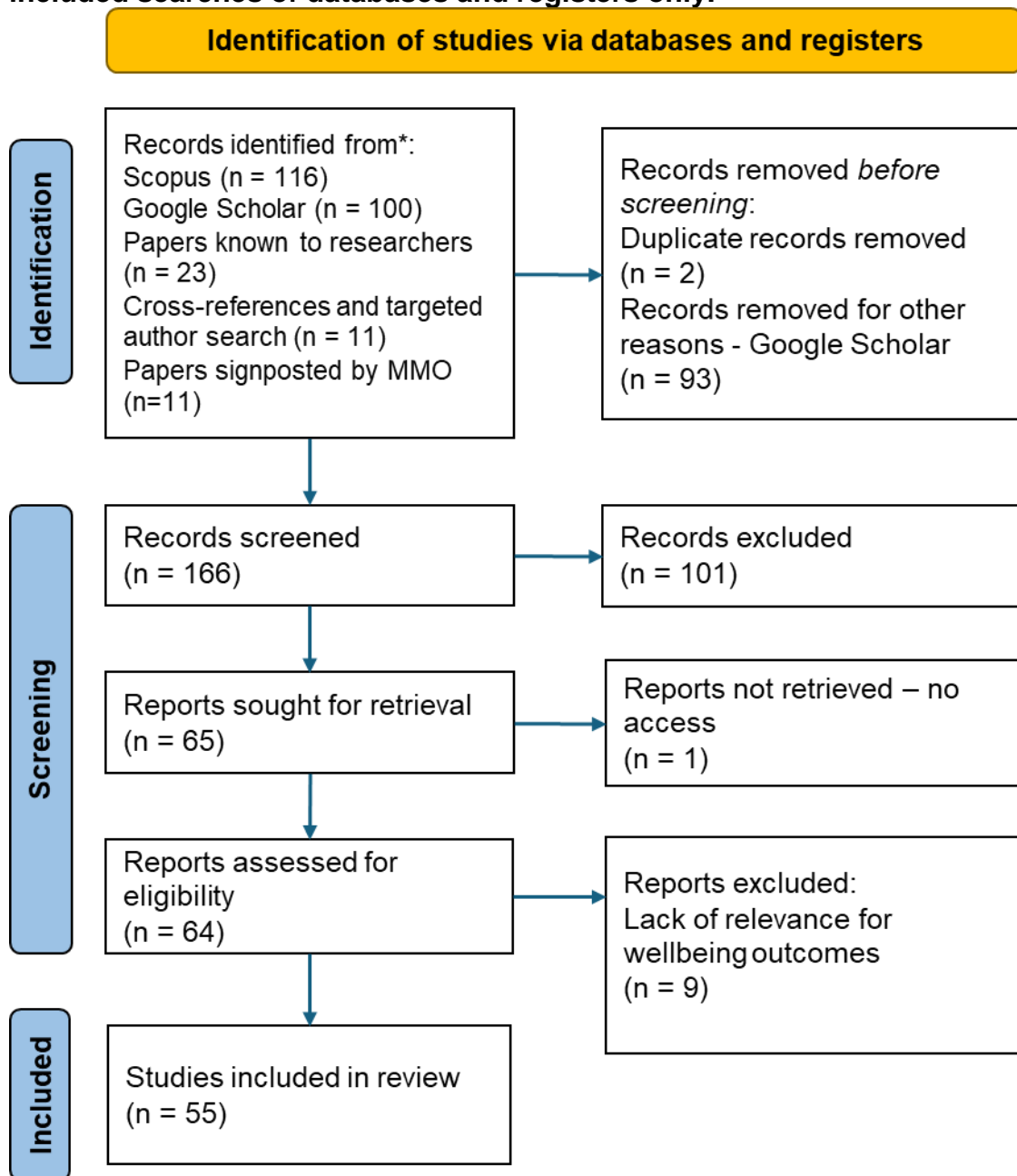
The PRISMA approach was followed when screening the literature (Figure B 1).

1. All titles, abstracts and links identified in the search from Google Scholar and Scopus were downloaded and captured in Excel. Only the first one hundred search results from Google Scholar were considered with the relevant papers being extracted to the Excel spreadsheet manually. Recommended articles from CCRI and the MMO, as well as targeted author searches were added to these lists.
2. Search result titles were screened to exclude duplicates and publications clearly out-of-scope.
3. Of those remaining, abstracts / executive summaries were screened to exclude out-of-scope publications.
4. The remaining papers / reports were read in full and irrelevant studies removed.
5. Data were extracted from the remaining papers.

Overall, the quick scoping review included 55 studies, comprised of peer-reviewed literature and grey literature.

¹ Google was explored as a source of grey literature, but the search string turned up excessive numbers of irrelevant studies.

Figure B 1 PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only.



B2.5 Approach to analysis

Data from each paper/ report reviewed were captured in an Excel spreadsheet. Data extracted included background details of the study, evidence for wellbeing outcomes and the barriers and enablers hindering or facilitating their emergence, and information relevant to the sensitivity of wellbeing outcomes to change. The evidence was then grouped thematically according to the wellbeing categories identified in the conceptual framework.

B3 Literature review findings

B3.1 Overview of the literature

This section provides a brief overview of the literature in terms of geographical coverage, study focus, type and scale of fishery examined by each study and whether each study applied a conceptual framework.

B3.1.1 Geography

While the majority of studies were conducted in England, locations in Scotland and Wales were also represented (Table B 2). The evidence for Northern Ireland was more limited. The literature also incorporated nationwide surveys, studies and reviews covering the entire UK, providing a diverse geographical coverage of fisheries across different regions.

While this literature review spans the UK, it has limitations and there are gaps in coverage. For example, all Welsh papers (other than one drawing on secondary data) refer to the same case study location. The scale of each study also varies, with some studies focusing on specific fishing ports and others taking a more regional view. It is therefore not possible to use the data to identify geographical trends.

Table B 2 Geographical focus of studies identified.

Country	Number of papers	Specific locations
UK	2	
England	31	<p>South-east: South-east England, Hastings, Rye, Whitstable, Isle of Wight.</p> <p>South-west: Plymouth National Marine Park, Sidmouth, Brixham, Cornwall, Padstow, Newlyn, Looe, Poole, Dorset, Beer, Lyme Bay.</p> <p>North-east: Northumberland, North Shields, Amble, Whitby, Grimsby.</p> <p>North-west: Whitehaven, Blackpool, Morecambe Bay.</p> <p>East: North Norfolk, Norfolk, Cromer, Wells-next-to-the sea, Sheringham, Lowestoft.</p>
Scotland	12	East coast Scotland, west coast Scotland, Orkney Islands, Fraserburgh, Shetland, Peterhead, Hebrides, Mull, Jura, Islay, Skye
Wales	8	Llyn peninsula
Northern Ireland	2	Portavogie, Ardglass, Kilkeel, Mourne, Lecale coast, Ards Peninsula, the north coast, and the cross-border area of Lough Foyle

B3.1.2 Focus

The studies reviewed diverse aspects of fisheries, often considering cultural ecosystem services, sense of place, and the sustainability of aquatic food systems. Common themes included:

- the concept of identity in fishing communities,
- the relationship between institutional arrangements and social dynamics in UK inshore fisheries,
- the significance of social capital in various contexts such as Marine Spatial Planning,
- community resilience, and
- the role of women in fishing communities.

The studies also delve into cultural sustainability, community wellbeing, and market conditions impacting inshore fishers. Additionally, some studies address health outcomes in the fishing industry, social change in fishing communities, and collaborative knowledge mobilisation.

B3.1.3 Type and scale of fisheries

The inshore fishery was an inclusion criterion for this review but was not the sole focus of this study. While most studies dealt primarily with inshore fisheries, some considered boats both under and over 10 metres, likely capturing fishers who fish further out to sea. In most papers, the type of fishery (demersal, pelagic, shellfish etc.) was not specified. The evidence gathered therefore, likely encompassed a broad range of target species. Where the type of fishery was specified, studies collectively dealt with a wide of range of finfish and shellfish species.

B3.1.4 Conceptual framework

Not all papers drew on a conceptual framework. Those that did applied a wide range of conceptual approaches, among which were sense of place, wellbeing, resilience, cultural ecosystem services and cultural/social capital. Other conceptual frameworks or focal themes examined, which were used in a small number of studies, included a lifecourse approach, dependency, belongingness, and gender.

B3.2 Social, cultural and economic wellbeing outcomes from fisheries

The first review question asked 'what are the social, cultural and economic wellbeing outcomes arising from fishing for fishers, their families, the occupational and place-based community?'. This section presents the findings from the review responding to this question, and categorises the evidence into material, subjective and relational wellbeing outcomes. It also captures data relating to how leaving the fishing sector impacts wellbeing outcomes.

B3.2.1 Material wellbeing outcomes

Material wellbeing refers to “*what a person has (the objective material resources that a person can draw upon to meet their needs, such as food, assets, employment, services and the natural environment)*” (Coulthard, 2012 p. 360, drawing upon Gough and McGregor 2007). Material wellbeing outcomes cover multiple wellbeing domains and can be objectively measured. These domains include the examples in the definition but can also be considered to capture capabilities such as health, skills,

knowledge and education (i.e., “facts about people’s lives and the spaces they live in” ONS, 2024). The review identified evidence for individual and family related economic outcomes such as income and employment, as well as outcomes for health, skills and knowledge. More broadly for the fishing and place-based community, the review found evidence for economic outcomes associated with fishing, such as tourism and creative arts.

Economic wellbeing outcomes: Fishing delivers economic wellbeing outcomes to fishers and their families in the form of income and security of employment, and provision of a livelihood in both fish catching and processing sectors (Jacob et al., 2023; Jennings et al., 2016; NEF Consulting, 2018; Ross, 2013; Thomson, 2001; Zhao et al 2013). In some communities, small-scale fisheries are found to provide more employment than large-scale fisheries (New Economics Foundation, 2011). Fishing also provides fish for consumption, contributing to food security in remote communities (Brooker et al., 2018; Thomson, 2001).

While fishing provides income and material security to families, its role has been decreasing over time. Fishers and their partners are diversifying family income, taking on various roles within and outside the fishing industry to provide stability and economic resilience (Britton and Coulthard, 2013; Gustavsson and Riley, 2018b; Szaboova et al., 2022; Winchenbach et al., 2022). In some cases, fishers are becoming secondary breadwinners under the pressures of changing market conditions and regulations, while partners (often women) are supporting the household financially (Morgan, 2016; Zhao et al., 2013). Female-led enterprises are frequently connected to their partners’ activity at sea and change in response to motherhood-induced family challenges (Gustavsson, 2021).

The fishing industry also provides economic gains to the place-based community. This can be directly through fish supplies and the fishing supply chain (e.g., upstream through chandlery, boat repair, electricians etc. and downstream in fish processing and sales) and indirectly through imagery and the symbolic nature of fisheries, stimulating tourism and the creative industries (Acott and Urquhart, 2011; CFPO et al., 2023; Gustavsson and Riley, 2020; NEF Consulting, 2018; Reed et al., 2013; Urquhart and Acott, 2013a; White, 2018). These indirect sectors provide both income and employment (Brookfield et al., 2005; Kirwan et al., 2018; Urquhart and Acott, 2013a). In some locations, ‘virtual fisheries’ with no link to active fishing have replaced authentic fisheries, creating an economic dependency on the symbolic image of fishing (Brookfield et al., 2005).

Health: While fishing can provide positive health outcomes through access to nutrition², fishing can also have detrimental health outcomes, both physical and mental (Coulthard and Britton, 2015; Szaboova et al., 2022). Drawing on census data, Turner et al. (2019) found that the fishing and aquaculture sector have the 5th highest rate of poor health (out of 87 sector categories). They also have amongst the poorest health outcomes of all workers in England and Wales, after accounting for geographic location, age and local socio-economic profiles. For some fishing types,

² No evidence was located for positive mental health outcomes from commercial fishing, but an absence of evidence should not be interpreted as evidence for an absence of positive mental health outcomes. There is a growing body of evidence for the mental health benefits of engaging with blue spaces (e.g., Defra 2019).

(e.g., Nephrops trawlers), drink and drug problems were also reported as frequent (NEF Consulting, 2016).

Both mental and physical health outcomes can improve for those who leave the fishing sector. Fishers who have started to diversify their income away from fishing have reported a sense of relief and improved physical and mental health (Winchenbach et al., 2022).

Skills and knowledge: Fishing also contributes to material wellbeing outcomes through the development of skills and knowledge. Fishers see themselves as a “Jack of all trades”. They require skills as a fisher, but also in boat and gear maintenance (Gustavsson and Riley, 2020). These skills are passed between generations (Urquhart and Acott, 2013a) and fishers recognise that these skills, and ecological knowledge, can only be built through experience and cannot be learnt from books (Acott and Urquhart, 2014). This knowledge accumulation feeds into the concept of the “good fisher” (Gustavsson, 2018), one that is skilful, knowledgeable and respectful of resources (Gustavsson et al., 2017).

B3.2.2 Subjective wellbeing

Subjective wellbeing (or personal wellbeing) focuses on people’s own experiences and perception of their lives. It includes aspects such as life satisfaction, positive and negative emotions, and whether their life is meaningful (Deiner et al., 1999). It can be measured through an individual’s self-report or evaluation of their lives.

Evidence in the literature for subjective wellbeing outcomes focuses primarily on identity and the contribution of fishing to this, as well as job satisfaction. Identity is considered a subjective wellbeing outcome as it represents a projection of the self-evaluation of an individual or community.

Occupational identity: Occupational identity was the most well studied subjective wellbeing outcome identified in the literature. For many fishers, fishing activity goes beyond a notion of job and is perceived as ‘a way of life’ or sometimes even as ‘a limb’ or ‘the soul’ (Acott and Urquhart, 2011; Britton and Coulthard, 2013; CR, 2009; Gustavsson and Riley, 2018a; Kirwan et al., 2018; Morgan, 2016; Ross, 2013; Urquhart and Acott, 2013a, 2014; Urquhart et al., 2011).

Autonomy and independence are essential elements of a fisher’s identity (Christy et al., 2021; CR, 2009; Gustavsson et al., 2017; Morgan, 2016; Ross, 2013). Fishers see themselves as ‘frontiersmen’ and the last ‘hunter gatherers’ of the developed world (CR, 2009). Fishers also perceive themselves as being highly skilled problem solvers, enabling them to read environmental signals and understand how to catch available resources (CR, 2009; Symes and Phillipson, 2009). They value highly the independence and freedom fishing offers them over decision-making (Coulthard and Britton, 2015). Their identity is interlinked with notions of self-worth, pride, determination, bravery associated with the dangers that the activity poses and survival against the odds in an industry in decline (Bakker et al., 2019; Britton and Coulthard, 2013; Reed et al., 2013; Winchenbach et al., 2022).

Identity also stems from technical competences, knowledge of the area and the physical strength that fishers need to undertake the job (Christy et al., 2021; Gustavsson and Riley, 2020; Reed et al., 2011). Knowledge and skills as an asset

are highly valued in the fishing sector (Reed et al., 2020) and the holding of these assets help to preserve identity into retirement (Gustavsson and Riley, 2018a).

Job satisfaction: All of the factors that contribute to identity described above also contribute to job satisfaction, which is an important component of fisher wellbeing (Britton and Coulthard, 2013; Coulthard and Britton, 2015). Job satisfaction is also affected by perceptions of safety, poor health, lack of economic security and inefficiencies in fisheries management, which can influence fishers' decisions to leave the sector (Coulthard and Britton, 2015).

Diversification and identity: Diversification from fishing has mixed impacts on a fisher's identity, challenging notions of independence and fishing heritage (Brooker et al., 2018; Morgan, 2016). Where diversification is within the fishing sector (e.g. entering new markets), for some fishers it fortifies the entrepreneurial element of their identity (Kirwan et al., 2018; Prospero et al., 2022). It also enables an expression of risk-taking, another characteristic of fisher identity (Morgan, 2016).

Where diversification is out of the fishing sector, the effects reported by fishers are varied. For some it induces a sense of loss and regret, and a feeling of being 'crippled' (i.e., a loss of identity), but for others this loss may be compensated by subjective wellbeing gains through a provision of relief and a feeling of being valued in the community through wider recognition and support (Winchenbach et al., 2022).

B3.2.3 Relational wellbeing outcomes

Relational wellbeing is defined as what a person does through social relationships that enables/or disables the pursuit of wellbeing (including relationships of care and love, relations with the state, social institutions, kinship, cultural rules and norms, forms of collective action, among others) (Coulthard, 2012, drawing upon Gough and McGregor 2007). This review has found evidence for wellbeing outcomes resulting from fisher-family relationships (e.g. intergenerational ties), fisher-occupational community relationships (e.g. social cohesion and group identity), fisher place-based community relationships (e.g. place identity) and fisher-institutional relationship (e.g. trust).

Intergenerational ties: Families are seen as sources of knowledge that is passed from father to son creating intergenerational ties to fishing (Gustavsson, 2018; Gustavsson et al., 2017; Urquhart and Acott, 2013a). Fishing is perceived as family heritage and legacy and reinforces the sense of individual and community identity, belongingness, and pride (Ainsworth et al., 2019; Gustavsson, 2022; Jamieson et al., 2009). Family ties to fishing also act as an important enabler to other wellbeing outcomes, facilitating access to the fishing industry, with "insiders" trusted more and outsiders from non-fishing families struggling to enter the sector and earn respect among hereditary fishers (White, 2015).

Social cohesion: The literature indicates that social cohesion is an important wellbeing outcome. In the occupational community, fishers' interactions are built upon notions of competition and cooperation, inherent in the nature of the fishing profession (Gustavsson et al., 2017; Reed et al., 2013). Fishing is a dangerous activity where survival can depend on community ties and understanding that fishers will come to each other's aid in times of need. Success is therefore contingent upon

networks and knowledge sharing among fishers (Acott and Urquhart, 2017; Gustavsson et al., 2017; Ross, 2013; Turner et al., 2014). Fishers are also tied to each other through risk, common experiences of isolation and loneliness (Ross, 2013). The solidarity or camaraderie that results is an important aspect of social cohesion (CR, 2009; Reed et al., 2011; Reed et al., 2013). This cohesion is strengthened by the employment of local crews (Thomson, 2001).

The boundaries of the fisher community also reinforce cohesion: only those who hold the same norms and values and are able to cope with harsh conditions are considered insiders and perceived as 'good fishers'. Others are seen as outsiders and not of the community, which makes access to the fishing industry highly restricted (Bakker et al., 2019; Gustavsson, 2018; Nightingale, 2013).

At a wider community level, fishing is seen as 'interwoven into the community and part of the social fabric' (Acott and Urquhart, 2011). The fishing industry acts as a community glue, creating place-based community bonds and further stimulating community cohesion (Urquhart and Acott, 2013b).

Relationships with place and group identity: Occupational community wellbeing is likely linked to the collective identity of fishers. This is interlinked with group attachment to place, reflecting rootedness in the community, sense of belonging and the notion of locality (Acott and Urquhart, 2017; Urquhart and Acott, 2014). In turn, collective identity expressed through sense of place can result in rivalry between port communities (Reed et al., 2011; Reed et al., 2013). Strong place-based community identity is, however, beneficial for resilience, encouraging the adaptive capabilities of fishers and place to changing environments and market conditions (Urquhart and Acott, 2013a).

Place identity: Place identity may contribute to wellbeing at different scales from individual to the wider community. The fishing industry is actively involved in placemaking, shaping place identity, and providing aesthetic, authentic, emblematic and inspirational wellbeing outcomes to visitors and locals (Acott and Urquhart, 2011, 2014, 2017; Ainsworth et al., 2019; CFPO et al., 2023; Reed et al., 2011; Urquhart and Acott, 2013a; White, 2018). Place identity is not only linked to fishers and the act of fishing. The image of a fisherwoman or fisherwife is a frequently used symbol in Scottish towns to attract tourists and emphasise the fishing heritage of places (Nadel-Klein, 2000).

Apart from attracting visitors to a fishing town, the fishing industry also reinforces cultural heritage and memory, and protects history and tradition of fishing towns with a deep connection to the sea (Acott and Urquhart, 2011, 2014, 2015, 2017; Reed et al., 2013; Urquhart and Acott, 2013a, 2014; White, 2018). Some fishers acknowledge that the co-existence of fishing and tourism in a place may be 'a future way of life' for communities deeply rooted in their fishing heritage (CFPO et al., 2023).

Relationship with policy and management: Relationships between fishers and policy and management institutions also contributes to relational wellbeing. Relationships between fishers and policy and management institutions can be strained which can affect other wellbeing domains (e.g. subjective wellbeing).

Fishers tend to have low levels of trust towards institutions and decision-makers coupled with a community feeling of being underappreciated by the government (Bakker et al., 2019; Ford and Stewart, 2021; Reed et al., 2020). Low levels of trust stem from a long-standing perception that decision-makers' fail to appropriately consider and address the needs of the sector or value their ecological knowledge (Anbleyth-Evans and Lacy, 2019; Reed et al., 2020).

B3.3 Diverse values

As highlighted in the conceptual framework (Annex A), the diverse values that individuals and communities hold will shape individual, societal and organisational behaviour and therefore influence the wellbeing outcomes that may result from fishing activities. Wellbeing outcomes do not map directly on to values, and while capturing evidence around values was not the main purpose of this review, some insights can be identified. Relevant definitions for this section are presented in Table B 3. As no studies focused specifically on worldviews or intrinsic values, they are not discussed further.

Table B 3 Definitions of diverse values.

Diverse values	Definitions
Worldviews	<i>“The ways through which people perceive, conceptualise and modify the world, rooted in cultures and languages (Olsen, 2019). Worldviews shape individual and collective ways of perceiving, interpreting and interacting with nature, and are expressed through culture, knowledge systems and languages” (IPBES, 2022).</i>
Broad values	General moral guiding principles and life goals (e.g., freedom, justice, responsibility, harmony with nature, harmony with Mother Earth, health, prosperity) informed by people’s worldviews and beliefs (Dietz et al., 2005). They are often embedded in a society’s institutions (i.e., informal social conventions and norms, and formal legal rules) and can underpin people’s specific values of nature (IPBES, 2022).
Specific values	Opinions on, or judgements regarding, the importance of nature in particular situations. Specific values comprise instrumental, intrinsic and relational values. (IPBES, 2022).
Instrumental values	A type of specific value, this refers to the importance of nature as a means to achieve a particular end (e.g. to satisfy human needs, interests or preferences) (IPBES 2022).
Intrinsic values	A type of specific value, this refers to the notion that something has value as an end-in-itself or has inherent or moral value that is not tied to human purposes (Devos et al., 2019).
Relational values	A type of specific value, referring to the preferences, principles, virtues associated with relationships, both interpersonal and as articulated by policies and social norms. They include “eudaimonic” values associated with a good life and are not present in things, but derived from relationships and responsibilities to them (Chan et al., 2016).

B3.3.1 Broad values

The evidence on fisher identity provides an indication of broad values held by fishers. Freedom, independence, autonomy, masculinity and belonging to the sector are core components of that identity (Christy et al., 2021; CR, 2009; Gustavsson et al., 2017; Morgan, 2016; Ross, 2013, Zhao et al., 2013). These broad values are embedded in the social norms around fishing, making entry into the sector challenging for those considered outside (see Section 3.4.1 and CR, 2009; Gustavsson and Riley, 2018a; Zhao et al., 2014).

B3.3.2 Instrumental values

The material wellbeing outcomes reported reflect the role that fishing plays in providing a means to an end. Fisheries are valued for their contribution to income (of individuals, families and occupational and place-based communities), employment and the health benefits associated with fish consumption. These values are however diminished when fishing poses a risk to occupational health, safety and security (see Section 3.2.1).

The role of fishing in a location is also valued for its contribution to other income generating activities. Heritage symbols and infrastructure (e.g. nets, huts, warehouses, ships' wheels) provide cultural value to a location that is capitalised upon by tourism and creative sectors (Acott and Urquhart, 2014; 2017).

B3.3.3 Relational values

The fisher-nature relationship makes an important contribution to the construction of fisher identity (Acott and Urquhart, 2011). Fishers express a deep connection to the sea and attachment to place, including islands, coasts and estuaries (Ainsworth et al, 2019; Nightingale, 2013; Urquhart and Acott, 2014). Nature and the sea provide inspiration, a sense of belonging and reinforce experiences of independency, autonomy, and freedom (Acott and Urquhart, 2011; Ross, 2013).

Shared experiences from fishing and social relationships between fishers and their families and other community members are also highly valued for their role in community life (Acott and Urquhart, 2011). There are tight bonds between fishers that contribute to solidarity and safety at sea (Reed et al., 2011), and reciprocal relationships that facilitate the sharing of knowledge (although these may be more common among fishers with perceived similar skill levels; Turner et al 2014). Social connections within the fishing industry are especially valued by fishers' wives and partners. Those staying onshore for long periods without their partner often experience a sense of loneliness, worry and deteriorating wellbeing (Britton and Coulthard, 2013; Reed et al., 2011; Ross, 2013; Szaboova et al., 2022) that can be ameliorated through social connections.

Sense of place and place identity discussed in Section 3.2.3 are also likely to influence how people behave towards and respond to changes in the fishing sector.

B3.4 Barriers and enablers to realising social, economic and cultural wellbeing outcomes

The second and third literature review questions focus on the barriers and enablers that hinder and facilitate the realisation of wellbeing outcomes from fisheries. Barriers and enablers will vary between and across individuals and locations, and will be experienced differently by different people. How barriers and enablers

influence wellbeing outcomes will be dependent upon the diverse values held by fishers, their families and communities and the range of capitals that they have access to (which may itself act as a barrier and/ or enabler). What constitutes a barrier to one may therefore be an enabler to another. The following section presents a combined summary of the range of barriers and enablers identified.

Barriers and enablers to entry into the sector are also discussed as these determine the ability of individuals and communities to realise fishery related wellbeing outcomes.

B3.4.1 Barriers and enablers

Barriers and enablers to wellbeing outcomes operate at different scales. Within the literature, evidence was found for global barriers (sometimes with local enabling responses), barriers and enablers relating to fishing practices and patterns, barriers and enablers that result from governance institutions and practices, and barriers and enablers at the family and community level. The role of diversification from the fishing sector into tourism and its role in achieving wellbeing outcomes is also noted.

Global barriers and local enabling responses: Some barriers to the realisation of fishing related wellbeing outcomes are global in nature and largely out of the control of individual fishers, their families and communities. These include, for example, market pressures and climate change. Fishers are subject to global and local market fluctuations, and changing dietary patterns, all of which significantly impact their livelihoods (Jennings et al., 2016) and are likely to affect both material and subjective wellbeing. Access and certification issues further complicate matters. Inequitable quota distribution and the high cost of certifications (such as Marine Stewardship Council) limit market access and reduce income potential (CR, 2009; Hadjimichael et al., 2013; Reed et al., 2013). In addition, changing weather patterns and sea temperatures are impacting the location of fish stocks. This has implications for fishers and their ability to catch target species with the gear they have access to. This may result in lost income and employment opportunities (Jennings et al., 2016).

In response to such changes, some fishers and their families have developed marketing and branding initiatives. Place marketing, local food branding, and integration with tourism activities have been demonstrated to add economic value and strengthen community identity (Reed et al., 2011; Urquhart and Acott, 2013b), likely contributing to all three wellbeing dimensions.

Fishing practices and patterns: The changing nature of fishing activities with growing competition, increased migrant labour and changing fishing patterns (resulting from, e.g., regulation, overfishing, climate change) can act as a barrier to relational wellbeing, but also has implications for material and subjective wellbeing. For example, community cohesion is easily strained by competition between small and large-scale commercial fishing and between recreational and commercial fishing due to the use of different gear types, technologies and fishing practices (traditional vs more modern) (Hadjimichael et al., 2013; Turner et al., 2014). An increase in migrant labour in the sector has been shown to reduce opportunities for local labour but also raises concerns about safety when communication is challenged by language skills (CR, 2009). Furthermore, perceived over regulation, overfishing, and extended time away from home due to changing fishing patterns (e.g., in response to

an MPA designation), can strain family relationships in addition to economic wellbeing outcomes (Hattam et al., 2014). It also likely strains relationships with governance institutions (see approaches to governance below).

Where competition can be reduced through, for example, effective separation of large and small-scale fisheries, small-scale fisheries have been able to gain autonomy and socio-ecological resilience allowing them to emphasise catch quality over quantity (Korda et al., 2023; Prospero et al., 2022) with the potential to benefit all wellbeing dimensions.

Approaches to governance and trust in governance institutions: Perceived mismanagement by government can result in fishers viewing government policies as hostile, impacting all dimensions of wellbeing. This furthers a loss of trust, reduces the perceived credibility in management institutions and presents a barrier to participation in management activities (Bakker et al., 2019; CR, 2009; Ford and Stewart, 2021; Gustavsson et al., 2017), which could help to build relational wellbeing.

Where collaborative management has been achieved, it plays a vital role in enhancing trust (and thereby relational wellbeing) and management effectiveness by involving fishers in management and decision-making processes, especially for issues such as those faced in the management of fishing in marine protected areas (Hattam et al., 2014; Reed et al., 2020). Similarly, skill and knowledge development through partnerships with research institutes and collaborative learning significantly improves the economic viability of fishers (Bakker et al., 2019) enabling improved material and subjective wellbeing outcomes.

Family ties and support: The catch sector has traditionally been a male dominated sector, with wives and partners providing a supporting role. Within fishing families, wives and partners are important facilitators of wellbeing outcomes across all wellbeing dimensions. They actively contribute to different aspects of the fishing business (albeit their contribution is not always recognised and acknowledged) (Gustavsson, 2021; Gustavsson and Riley, 2018b; Morgan, 2016; Szaboova et al., 2022). Wives and partners also build social relationships, support their partners' health, help to strengthen father-child relations, complement family income (sometimes acting as the primary bread winner), and connect their husbands with the wider society (Reed et al., 2011; Szaboova et al., 2022; Zhao et al., 2013; Zhao et al., 2014). Women's role has also been changing in relation to advocacy with more women engaging in decision-making processes and communicating with politicians, driven by concerns for family and community (Zhao et al., 2014).

Family ties also support a fisher's resilience to industry decline, with fisher dedication to fishing rooted in generational fishing practices (Acott and Urquhart, 2011; Kirwan et al., 2018). Smaller, kinship-based fishing communities with similar fishing practices often hold stronger social bonds and information sharing (Turner et al., 2014). This helps individual fishers overcome economic shocks with stoicism (Gustavsson and Riley, 2020). Conversely, this may also lock individuals into a sector with a limited future and implications for all dimensions of wellbeing.

Community wellbeing: For family members remaining onshore while fishers are away at sea it can be lonely and isolating, with particular implications for subjective wellbeing. Networking and organisational support (i.e., building relational wellbeing) are essential for overcoming isolation and building confidence among community members (Gustavsson, 2022; Zhao et al., 2014). Examples of this include the building community-based networks and female-led organisations (Zhao et al., 2014).

Diversification from fishing: Tourism is perceived by some fishing communities as a factor degrading sense of place and community cohesion (i.e., an element of relational wellbeing) because of the loss of authenticity and the entry of (non-fishing) newcomers. However, not all view tourism as a barrier, others see it as an enabler and an essential economic revenue stream (Acott and Urquhart, 2011, 2014) and hence material and subjective wellbeing.

B3.4.2 Barriers to participation in the fishing sector

Economic challenges, gender norms and the mechanisms through which knowledge and information are shared within the sector are important barriers to participation in fishing activities and hence the achievement of fishing related wellbeing outcomes:

Economic challenges: Increased property prices, the loss of basic services, and limited employment opportunities have led to the depopulation of coastal communities, particularly among young people resulting in fewer entrants into the fishing sector (Urquhart et al., 2011).

Regulatory hurdles: Economic challenges are exacerbated by regulatory hurdles where stricter regulations and higher set-up costs deter new entrants, especially the younger generation, from pursuing careers in fishing (Gustavsson and Riley, 2018a; White, 2015).

Gender norms: Commercial fishing is a predominantly male occupation and the identity of fishers is frequently associated with masculinity (Gustavsson and Riley, 2020; Szaboova et al., 2022). This masculine identity can make it challenging for women to enter the sector. Women must work 'twice as hard' to gain respect and recognition, while overcoming negative attitudes and cultural taboos (Zhao et al., 2013; Zhao et al., 2014).

Knowledge and communication: The fishing industry typically employs a patrilineal transfer of knowledge. This reinforces traditional gender roles making it difficult for women to enter the catching sector (Gustavsson and Riley, 2018b). Policy and management communications within the sector are also typically aimed at male fishers creating further barriers to participation and understanding, particularly for women and newcomers (CR, 2009; Gustavsson, 2022; Zhao et al., 2014).

Family ties: Strong family ties and inherited cultural and social capital aid entry into the industry and skill development, promoting a sense of community and belonging (Gustavsson and Riley, 2018a), but can result in the exclusion of individuals from non-fishing families (White, 2015).

B3.4 Sensitivity of wellbeing outcomes to change

The final review objective was to explore how sensitive wellbeing outcomes from fishing activities are to changes in environmental, economic, or regulatory conditions (i.e., the degree to which the wellbeing outcomes may be adversely or beneficially affected by environmental, economic or regulatory change). Understanding this is important as it will influence the selection of appropriate indicators that can be used to track wellbeing outcomes over time; an important characteristic of an indicator is that it is sensitive and can detect a response to the change of interest.

The literature reviewed typically does not assess the sensitivity of wellbeing outcomes in detail. While it identifies how changes in some wellbeing outcomes may result in changes across others, it provides little evidence of the scale of change or how wellbeing outcomes respond over time (e.g., speed or magnitude of change). Little can therefore be concluded about the extent to which wellbeing outcomes may respond in similar or different ways to the same pressure or how wellbeing outcomes respond to cumulative pressures. Consequently, the vulnerability of the sector remains unpredictable. The text below summarises factors identified in the literature that may have a particular influence on the ability of fishers, their families and communities to derive wellbeing outcomes from fishing activities and how wellbeing outcomes may respond to change (i.e., they may influence the sensitivity of wellbeing outcomes to change).

Labour changes and crew dynamics: As labour and capital become more mobile, traditional links between fishing fleets, home ports, and local fishing grounds are weakening. This shift is resulting in a move away from kinship-based networks towards more formal contractual relationships (Symes, 2000). Such changes not only dilute the sense of 'local dependence' but also challenge social cohesion and cultural identity within fisheries-dependent communities (Symes and Philippon, 2009).

Changes in labour availability are also affecting crew dynamics causing a shift from traditional family-based crews to reliance on migrant workers. This is resulting in a growing sense of dissatisfaction among fishers (Coulthard and Britton, 2015; Ross, 2013). These evolving dynamics affect adaptation strategies and the wellbeing of fishers and their families, causing feelings of isolation (Coulthard and Britton, 2015; Ross, 2013).

Changes in gender roles: Gender roles within occupational fishing communities have been changing (Urquhart et al., 2011), albeit slowly (Zhao et al., 2013). This restructuring of the fishing industry and the growing role of tourism are reshaping perceptions of masculinity (Gustavsson and Riley, 2020). This change is empowering women, who are seen as icons of fishing communities (Nadel-Klein, 2000, Urquhart et al., 2011) and facilitating their participation in multiple aspects of the fishing sector (from catch to processing and administration) (Gustavsson and Riley, 2018b). This shift is complicated by the changing nature of employment and livelihoods in response to climate change and varying weather patterns (Jennings et al., 2016). No evidence was found for the implications of these changing gender roles for fishers, but it can be anticipated that changing gender roles may have implications for family and community wellbeing.

Engagement in management: Where increased participation of fishers in management discussions has occurred (for example, industry-science partnerships such as the GAP2 project and Seafish common language groups) higher levels of trust in governing institutions have been reported enabling the initiation of a move towards more collaborative management (Ford and Stewart, 2021). Increased fisher organisation is also reported to enhance their influence on governance decisions, indicating a shift in power dynamics (Jacob et al., 2023). Both factors are likely to facilitate the generation of more positive wellbeing outcomes from fishing across all wellbeing dimensions.

Integration of small-scale with large-scale fisheries: The identity of fishing communities is sensitive to their level of integration within the English fishing sector. Greater integration with large-scale fisheries potentially diminishes certain economic and cultural outcomes associated with small-scale fisheries (Korda et al., 2023) with implications for the wellbeing outcomes achieved.

Diversification: Identity and sense of place are challenged by the ‘touristification’ of the fishing industry and globalisation forces that affect the unique image of a fishing town (Brookfield et al., 2005; Urquhart and Acott, 2013a). As highlighted above this move towards tourism is viewed both positively and negatively with the impacts on wellbeing differing according to scale (i.e., fisher, fisher family or occupational or place-based community).

B4 Discussion and conclusions

The findings presented in this Annex provide an overview of the literature on the social, cultural and economic wellbeing outcomes from fishing in the UK, structured around the wellbeing outcomes element of the conceptual framework presented in Annex A.

B4.1 Overview of findings

Material wellbeing outcomes include economic factors, such as income and employment from fishing and the fishing supply chain as well as income and employment from fishing related tourism. The literature highlights their changing relative importance over time. Material wellbeing outcomes also include health outcomes that can be both positive and negative, and a diverse range of skills and knowledge.

The diversity of potential subjective wellbeing outcomes was not well captured in the literature. Evidence primarily related to occupation identity (which was well studied) with some evidence also for job satisfaction and the impact of diversification on this. Further research is needed to understand subjective wellbeing outcomes more fully.

Evidence for relational wellbeing outcomes relate to the importance of intergenerational ties; social cohesion; relationships with place, place identity and group identity; and relationships with policy and management. A reasonable body of evidence was found, but as with the other elements of wellbeing, it was not possible to explore how these outcomes vary by location, fisher or community type.

The review also provided insights into potential barriers and enablers that hinder and facilitate the realisation of wellbeing outcomes, although the evidence for this is limited within the literature reviewed. Barriers and enablers are interlinked with some factors described being both barriers and enablers depending on whether they are present or not and increasing or decreasing. For example, social cohesion can be a wellbeing outcome in itself, but can also enable other wellbeing outcomes or hinder their realisation if cohesion is lost.

Furthermore, the literature provides little detail of how diverse values may influence the emergence of wellbeing outcomes, indicating a gap in the evidence base.

B4.2 Limitations

The wellbeing component of the conceptual framework provides a useful structure around which to organise the evidence on wellbeing outcomes. However, if the effect of management interventions on wellbeing outcomes is to be better understood, **it will be important to understand the evidence relating to capital assets and diverse values**. Not all fishers and fishing communities (occupational or place-based) are the same. They will have different levels of access to assets and hold different values. These will influence both the extent to which wellbeing outcomes can be achieved and whether the processes for achieving wellbeing outcomes can be activated. This suggests that outwardly similar fishers and fishing communities may respond in different ways to the same intervention.

It has not been possible to assess the levels of certainty in the evidence nor the extent to which the wellbeing outcomes are likely to emerge or be present across the whole of the UK's inshore fishing fleet or just parts. While the literature review has captured evidence from across the UK, **there is insufficient detail to understand how wellbeing outcomes may vary geographically or by fishing practice**. Data collection methods reported in studies have largely involved in-depth interviews, but studies have had different objectives and employed distinct theoretical or conceptual frameworks. While this provides evidence of a range of potential wellbeing outcomes data are insufficient to disaggregate further. A large-scale, cross-UK exercise is needed to consistently collect relevant evidence for material, subjective and relational wellbeing outcomes. This could be achieved through, for example, the Defra fisher social survey, but will require the addition of questions relevant to the conceptual framework developed through this project. An alternative could be a large-scale qualitative study focused on case study locations drawn from a typology of fishing communities. However, engagement demands on fishers are currently high due to the preparation of Fisheries Management Plans (FMPs) and the timing for such a study would need careful consideration.

There is a lack of evidence regarding the sensitivity of wellbeing outcomes to change. The evidence presented largely focuses on what the wellbeing outcomes are and identifies some barriers and enablers to their realisation. The studies essentially provide a stock take, but do not capture how these wellbeing outcomes change over time, nor how they respond to different sources of change (e.g., management measures that affect fishing practices or ecosystem change that affects stock availability). In addition to gathering consistent and regular data on wellbeing

outcomes, a useful next step would be to map out the logic chains that identify the links between ecosystem change, change in other forms of capital (e.g., human, social, cultural and economic), the barriers and enablers and the wellbeing outcomes using a systems thinking approach. As this may not be possible for all wellbeing outcomes, a short list of priority outcomes would need to be identified.

B4.3 Next steps

This review has identified potential steps that the MMO could take to strengthen the evidence base relating to the wellbeing outcomes from fishing for fishers, their families, and their occupational and place-based communities. The next step for this project will be to explore potential indicators for some of the wellbeing outcomes identified. The creation of a short-list of priority indicators will help the MMO identify where it might be most useful to focus its efforts in building the evidence base.

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